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ABSTRACT

The program and abstracts of the presentations of the 1991 meeting of the Society for College Science Teachers are the topics of this report. Society officers are listed, a history of the society is provided, and membership information is given. The presentations reflect different topics in the teaching of college science. The abstracts of presentations include the presenter's address. Abstracts of regional meetings for the society are also given. (PR)

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ED 364 414

SOCIETY FOR COLLEGE SCIENCE TEACHERS

Programs and Abstracts

Volume 11, 1991

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PURPOSE OF SCST

To provide a forum for interdisciplinary interaction among teachers of science at all institutions of higher education

PROGRAMS AND ABSTRACTS
VOLUME 11
1991

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HISTORY OF THE SOCIETY

The need for such an organization was identified by a group of concerned individuals within the National Science Teachers Association (NSTA). Significant to their concerns was a lack of a forum through which college science teachers could interact in an interdisciplinary manner with their colleagues from other institutions. The Society for College Science Teachers (SCST) was established on March 24, 1979 in Atlanta, Georgia during the NSTA meetings by participants attending an NSF-sponsored program on undergraduate education.

In April, 1981, the SCST became an official affiliate of the NSTA. The merger provides for increased services for college science teachers in assisting them to reach their personal objectives as well as those of the profession.

GOALS OF SCST

Improvement in the teaching of college science courses via interdisciplinary interactions among teachers of college science.

Provision of a profession-wide identity for teachers of college science.

Promotion of a societal and cultural awareness of the significance of science to the modern world.

Sponsorship of appropriate projects such as local and regional conferences and workshops.

Promotion of collective self-interest.

BENEFITS

Conferences

During the spring of each year, convention programs and paper sessions are held as part of the NSTA Annual Convention. These meetings enable college science teachers to communicate with each other and to learn what is happening at other levels of science teaching. Regional and local SCST conferences have been organized for the exchange of ideas and experiences, and discussion of issues of local concern. Local conference highlights are summarized in the SCST Newsletter.

The Journal of College Science Teaching (JCST)

SCST members receive the JCST which is published by NSTA six times a year. It contains feature articles on issues and topics of interest to college science teachers, new college science approaches, editorials, news items, book reviews, abstracts of selected articles, equipment and new products information, reviews of instructional media, national and legislative perspectives on college science teaching, and advertisements.

SCST Newsletter

The SCST Newsletter provides a regular source of information about Society business, projects, and membership activities. It is a source for keeping up-to-date with the Society and new developments in college science teaching.

Committees

In recognition of the importance of local area efforts to whatever success SCST may achieve, several working committees were established in 1982 in order to provide for increased program direction as well as for increased member participation. A continuing evaluation of the appropriateness of such efforts has resulted in the present SCST committee structure:

- Advanced Undergraduate Courses
- High School/College Articulation
- Introductory Courses
- Science and Technology
- Liaison
- Membership
- Resources/Development

To join us in the Society for College Science Teachers, complete this page and mail to:

Society for College Science
Teachers Membership
1742 Connecticut Avenue, N.W.
Washington, DC 20009

Name

_____

Institution/Organization

_____

Address_____

City_____

State_____Zip_____

Phone (_____)_____
Area

Yes, I want to join the SCST. Please enroll me for the membership shown below:

_____ $36 SCST membership only. Includes subscription to The Journal of College Science Teaching

_____ $50 Joint SCST/NSTA membership. Includes subscription to The Journal of College Science Teaching and NSTA privileges.

Make check payable to: SCST/NSTA Membership

Canadian members add $8.00 for postage.

_____ Please charge my credit card. _____ Visa _____ Master Card

Card # _____ Exp. Date _____

Signature _____

NOTE: On June 1, 1991, dues will rise to $51 for SCST-only memberships and to $60 for joint SCST/NSTA memberships.

STATE MEMBERSHIP CHAIRPERSONS

The following states lack membership chairs: ARIZONA, ARKANSAS, DELAWARE, HAWAII, IDAHO, INDIANA, IOWA, LOUISIANA, MAINE, MISSOURI, OREGON, and WEST VIRGINIA. To volunteer to serve your state, contact Brooke Pridmore, Clayton State College, Morrow, GA 30260.

ALABAMA: H. Wayne Shew, Division of Science and Mathematics Birmingham Southern, Birmingham, AL 35254

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PROGRAM

SOCIETY FOR COLLEGE SCIENCE TEACHERS
NSTA NATIONAL CONVENTION -- MARCH 27-30, 1991, HOUSTON, TX

BUSINESS MEETINGS AND SOCIAL FUNCTIONS

Thursday, March 28
8:00 AM — 12:00 Noon and 3:00 -- 6:00 PM
Gladewater Room, Four Seasons Hotel
EXECUTIVE COMMITTEE MEETING

Friday, March 29
7:30 -- 9:00 AM
Travis Room, Four Seasons Hotel
SCST PAST PRESIDENTS BREAKFAST

3:30 -- 4:30 PM
Conroe Room, Four Seasons Hotel
ANNUAL BUSINESS MEETING

4:30 -- 6:00 PM
Conroe Room, Four Seasons Hotel
SCST SOCIAL

CONTRIBUTED PAPERS

ALL SESSIONS WILL BE IN THE CONROE ROOM OF THE FOUR SEASONS HOTEL
EXCEPT AS NOTED BELOW

SESSION 1

Wednesday, March 27
7:00 — 8:00 PM
Presider: Ted Lopushinsky, Michigan State University

TEACHING SCIENCE TO NON-SCIENCE MAJORS
William McIntosh, Delaware State College and Mario Caprio, Suffolk Community College

SESSION 2

Wednesday, March 27
8:00 -- 9:00 PM
Presider: Ted Lopushinsky, Michigan State University

WHAT RESEARCH SAYS TO THE COLLEGE SCIENCE TEACHER
William Holliday, University of Maryland

SESSION 3

Thursday, March 28
1:30 -- 2:00 PM
Presider: Douglas Schamel, University of Alaska

THE EFFECTS OF UV RADIATION ON THE VIABILITY AND REPRODUCTIVE SUCCESS OF PARAMECIUM BURSARIA UNDER VARIED DIETS
Petrija Marinkovic and Thomas Lord, Indiana University of Pennsylvania

UPDATING HISTORY OF SCIENCE FOR THE CLASSROOM
Maura C. Flannery, St. John's University

SESSION 4

Thursday, March 28
2:00 -- 3:00 PM
Presider: Douglas Schamel, University of Alaska

INQUIRY-BASED LABORATORIES AT THE COLLEGE LEVEL: HOW TO BUILD THEM, HOW TO USE THEM
Douglas Schamel, University of Alaska, William Leonard, Clemson University, Helen Koritz, College of Mount St. Vincent, Richard Mortensen, Albion College, Henry Knizeski, Jr., Mercy College, Vincente Llamas, New Mexico Highlands University

SESSION 5

Friday, March 29
9:30 -- 10:30 AM
Presider: Elizabeth Hays, Barry University

A LOOK AT GENERAL LIFE SCIENCE ILLITERACY IN COLLEGE
Thomas R. Lord, Indiana University of Pennsylvania

SPECIAL UNDERGRADUATE EDUCATIONAL OPPORTUNITIES FOR THE UNDERREPRESENTED IN SCIENCE -- THE MARC PROGRAM
Elizabeth T. Hays and Sr. John Karen Frei, Barry University

HOW INTERMEDIATE OBJECTIVES SIMPLIFIED CHEMISTRY
Rudolph B. Jones, Essex County College

SESSION 6

Friday, March 29
11:00 AM — 12:00 Noon
Presider: Eleanor D. Siebert, Mount St. Mary's College

INTRODUCTION TO INTERFACING LABORATORY INSTRUMENTS TO MICROCOMPUTERS USING RAPID SYSTEMS COURSEWARE
Francis E. Gardner and Tsun-Hsiung Kao, Columbus College

INTEGRATING UPDATED INSTRUMENTATION INTO THE SCIENCE CURRICULUM
Eleanor D. Siebert, Mount St. Mary's College

THE INSTRUMENTATION AND LABORATORY IMPROVEMENT PROGRAM
Duncan MacBride, National Science Foundation

SESSION 7
THIS SESSION WILL MEET IN THE LASALLE BALLROOM OF THE DOUBLETREE HOTEL

Friday, March 29
2:00 -- 3:00 PM

ONE EARTH, MANY WORLDS
David Black, Lunar and Planetary Institute
Franklin Chang-Diaz, NASA
Ted Lopushinsky, Michigan State University

SESSION 8

Saturday, March 30
9:30 -- 10:30 AM
Presider: Nathan Dubowsky, Westchester Community College

ARISE: A REMEDIAL INTERDISCIPLINARY SCIENCE EXPLORATION
Catherine DeSa, Eileen Walsh and Kathryn Malone,
Westchester Community College

PROBLEM-SOLVING AND COMPUTER-SIMULATED EXPERIMENTS IN COLLEGE SCIENCE TEACHING
Jerry P. Suits, Brazosport College

SESSION 9

Saturday, March 30
11:00 AM — 12:00 Noon
Presider: Sterling Smith, Texas Women's University

ADVANCING FRONTIERS: THE SCIENCE OF CANCER
James W. Bowen, University of Texas

SESSION 10

Saturday, March 30
12:30 -- 1:30 PM
Presider: Rebecca Halyard, Clayton State College

PERSONALIZING CHEMISTRY: VIDEOTAPED INTERVIEWS OF RESEARCHERS
Carolyn Sweeney Judd, Houston Community College

POPULARIZATION OF SCIENCE: AN HISTORICAL CASE STUDY
Robert M. Hendrick, St. John's University

THE SCIENCE OF CANCER

James M. Bowen
M D Anderson Cancer Center
The University of Texas

A presentation of some of the major advances made in the ability to diagnose, treat, understand and prevent cancer. The presentation will include information that can be taught in college and high school science courses. The importance of the undergraduate science curriculum in preparing students for careers in the biomedical sciences will be addressed. The talk concludes with some brief insights on how teachers might channel young minds into careers in science.

ARISE: A REMEDIAL INTERDISCIPLINARY SCIENCE EXPLORATION

Catherine DeSa, Kathryn Malone and Eileen Walsh
Biology/Chemistry Departments
Westchester Community College
Valhalla, NY 10595

This course evolved as the science component of a program designed to prepare disadvantaged women on public assistance for entry into college programs in the health care professions. It has broader application to the unprepared college population in general. The uniqueness of this course is the hands-on, interdisciplinary approach to biology and chemistry remediation. The objectives include familiarizing students with basic concepts and laboratory procedures in biology and chemistry so they gain knowledge, experience and confidence in a collegiate science laboratory course. To achieve these aims, a variety of media and technologies are incorporated into the teaching and learning experiences. Interactive video, film, computerized self testing, dissections, general experiments as well as lectures are among the diverse activities included in the course. Mastery testing is employed and student tutors who attend the classes are available on a regular basis to assist the class members in all aspects of the course, i.e. homework assignments, projects and test preparation. In this presentation we will share with the participants the overall course outline and specific objectives. We will demonstrate the use of interactive video and discuss the varied kinds of experiences and the rationale for the same. Data concerning the success of the course in preparing students for credit courses will also be shared with participants.

UPDATING HISTORY OF SCIENCE FOR THE CLASSROOM

Maura C. Flannery
Division of Computer Science, Mathematics and Science
St. John's University
Jamaica, NY 11439

James Conant's On Understanding Science is a classic in science education literature. In it he presented his case history method for teaching science to nonscientists. His goal was to give them an appreciation for "the tactics and strategy of science." Forty years later, this goal is still an important one in science education , and his approach is still a viable one. But some updating is needed. Conant's case histories were well-developed in terms of illustrating the processes of science, but they did not develop in any detail the relationship of science to the wider culture. Today, when the influence of science on society is so great, it's important for students to appreciate this influence as well as its opposite: society's affect on science. It is often easier to see such influences in a context other than our own, so studying the history of science can be very useful. It can be most effective when Conant's approach is updated in the light of recent work on the sociology of science and on cultural history. This presentation will survey such work and show how it can help to bring Conant's method into the 21st century.

INTRODUCTION TO INTERFACING LABORATORY INSTRUMENTS TO MICROCOMPUTERS USING RAPID SYSTEMS COURSEWARE

Francis E. Gardner
Department of Biology
Columbus College
Columbus, GA 31993

Tsun-Hsiung Kao
Dept. of Chemistry
Columbus College
Columbus, GA 31993

Bo Ray
Rapid Systems, Inc.
433 N. 34th Street
Seattle, WA 98103

Interfacing laboratory instruments with microcomputers has become a requirement for the successful completion of scientific investigations. This presentation will review an introductory sophomore level course of instruction that teaches science students to use a commercially available computer-based data acquisition and analysis system. This system employs an IBM compatible PC that is a stand alone, integrated turn-key digital oscilloscope, spectrum analyzer, and data logger. This course, offered at Columbus College and made possible by an NSF Instrumentation and Laboratory Improvement Grant, introduces the student to instrumentation that incorporates fundamental principles of measurement, data acquisition, analysis and communication. Conceptually, this course provides "driver training" of the microcomputer while expanding the student's future options for becoming the equivalent of computer "technicians and mechanics". This will prepare them to interact more intelligently as a team member with computer scientists and engineers, thereby enhancing their ability to apply computing methods to the solution of research and educational problems.

SPECIAL UNDERGRADUATE EDUCATIONAL OPPORTUNITIES FOR THE UNDERREPRESENTED IN SCIENCE: THE MARC PROGRAM

Elizabeth T. Hays and Sr. John Karen Frei
Department of Biological and Biomedical Sciences
Barry University
Miami, FL 33161

Numerous support programs for underrepresented students exist in the sciences for the graduate science student. At the undergraduate level the support programs are quite limited but an important one is the National Institutes of Health -- General Medical Sciences Minority Access to Research Careers (MARC) Program. The authors will present some of the special educational features that have been developed in the MARC program at Barry University. These features will be presented as a model that could be useful in the teaching of science to underrepresented undergraduate science students.

POPULARIZATION OF SCIENCE: AN HISTORICAL CASE STUDY

Robert M. Hendrick
Division of Social Sciences
St. John's University
Jamaica, NY 11439

This paper will demonstrate how science can be successfully popularized by drawing lessons from a period in French history in which science experienced wide-spread popularity and public support. One of the most interesting aspects of late nineteenth-century France was the extraordinary popularity and wide acceptance of science by both the educated classes and the general public. This presentation will examine the diverse factors behind this situation. Among them were: the role played by popular fiction such as that of Jules Verne; the establishment of numerous scientific periodicals aimed at the educated public; the use of universal exhibitions to spread the message of science to the mass public; the role played by professional popularizers and the widespread use of art to glorify science and scientists; the contribution made by government involvement in science. The paper will conclude by showing how these factors can provide precedents for our contemporary society. It will demonstrate how they can be modernized and utilized by science today in order to enable it to gain greater acceptance by the public.

WHAT RESEARCH SAYS TO THE COLLEGE SCIENCE TEACHER

William G. Holliday
Past President, NARST
Dept. of Education
University of Maryland
College Park, MD 20742

Research in science teaching seldom focuses on the needs and concerns of the college science teacher. Research-based principles of particular concern to college science teachers include: 1) Most test items at the college level in science apparently fail to measure higher order thinking. Too often students can memorize huge amounts of information, mechanically practice solving problems like the ones on the test and still pass. Ways of measuring item goodness in this respect will be described. 2) Why do many freshmen know so little about science after taking so much science in high school? Reasons include presenting too many poorly explained science concepts and using "new and improved", but untested, programs required by school officials. Simple ways of competently assessing programs at the college level will be described. 3) Merely reducing class size has not increased older students' achievement. Reasons for these negative results and separate arguments for reducing college class sizes will be discussed. 4) Some college science teachers still believe in the contemporary validity of Bloom's taxonomy, cognitive learning styles, Piaget's four across-the-board cognitive stages of thinking, genetic-gender mathematical deficiencies in women, and the relative importance of "wait time". Alternative, more recent, research-based principles relevant to college science teachers will be presented.

HOW INTERMEDIATE OBJECTIVES SIMPLIFIED CHEMISTRY

Rudolph B. Jones
Department of Chemistry
Essex County College
303 University Avenue
Newark, NJ 07102

This presentation will demonstrate how the use of behavioral intermediate objectives can make teaching a science class easy for both teacher and student. It will be demonstrated that they can be written in such a way to elicit all levels of learning. Once written, your behavioral intermediate objectives make selection of material for inclusion in a course simpler. One will also be able to write test items that are to the point. This method also aids students without disciplined study habits. The selection of demonstrations, A-V material, computer material, field trips, and experiments will be improved as one concentrates on behavioral intermediate objectives.

PERSONALIZING CHEMISTRY: VIDEOTAPED INTERVIEWS OF RESEARCHERS

Carolyn Sweeney Judd
Department of Chemistry
Houston Community College
P.O. Box 7849
Houston, TX 77270-7849

To bring the excitement of on-going research to the classroom lecture, to put a person behind the data on the textbook pages -- these were the motives behind this project of the development of 5 short videotaped interviews of researchers in their laboratories at the Texas Medical Center in Houston. Details of the process of making these tapes and the reception of the students who watched the tapes in the classroom will be presented. Samples of the videotapes will also be shown. Major effort was made to keep the tapes short enough to maintain student attention (15 minutes), while focusing on the special research done in each laboratory. Researchers donated their time and were helpful in keeping explanations simple. Laboratory instruments and procedures are also included. The Office of Staff and Instructional Development of Houston Community College provided taping and editing services. The project was underwritten by a grant from the Bedichek Faculty Development Fund. Titles of the tapes and the researchers are as follows: "Positron Emission Tomography", E. Edmund Kim; "Glycoprotein Hormones of the Pituitary Gland", Darrell N. Ward; "Parasites and Enzymes", Cynthia L. Chappell; "Lipids and Lifestyles" and "Lipoproteins", Joel D. Morrisett.

A LOOK AT GENERAL LIFE SCIENCE ILLITERACY IN COLLEGE UNDERGRADUATES

Thomas R. Lord
Biology Department
Indiana University of Pennsylvania
Indiana, PA 15705

Several recent studies have suggested that students of today score lower on exams of general knowledge than did their counterparts a decade ago. Not only have the means of various national achievement tests, such as the SAT and ACT revealed this down-swing, but several contemporary surveys of student knowledge conducted on high school and college campuses by various educationally-minded groups also suggest this alarming trend. A survey of the National Geographic Society, for example, revealed that a surprisingly high number of high school students could not locate the United States on a world globe. How do students of today fare on tests of general life science knowledge? To find out a survey was conducted on college freshmen at a mid-size eastern university. The survey consisted of twenty-five questions of basic life science knowledge drawn from textbooks designed for middle school students. Over 300 students took part in the survey. Predictably, significant differences were found between the mean scores on the questionnaire and the student's college major. However, many life science majors missed questions that they shouldn't have. Marq, for example, did not realize that spiders were not insects or that green plants release oxygen only during the non-lite hours of the day. Altogether, biology majors scored at or below the seventy-fifth percentile on a third of the survey questions. Females also scored higher than males on more than half the items and older students tended to outperform their younger counterparts throughout the questionnaire.

DIET AS A SCREEN ON UV SUSCEPTIBILITY IN TWO SPECIES OF PARAMECIA

Petrija Marinkovic and Thomas Lord
Indiana University of Pennsylvania
Indiana, PA 15705

Research suggests that starved paramecia are more susceptible to UV radiation than are unstarved paramecia. In this study two species of Paramecium (P. bursaria and P. caudatum) were examined after consuming separate diets of yeast, skim milk and Paramecium Growth Medium (Carolina Biological Supplies) and treatment with UV radiation. Differences in UV susceptibility were found not only between the two species but among the various food media as well. This comparative study suggests that individual species use the food media in different ways. Whereas some diets are capable of protecting one species the same media may not be able to protect another.

POINT/COUNTERPOINT
SCIENCE FOR NON-MAJORS

William J. McIntosh
Science Education
Delaware State College
Dover, DE 19901

Mario Caprio
Dept. of Biology
Suffolk Community College
Selden, NY 11784

This presentation will offer a forum for exploring three controversial issues related to teaching science to non-majors. The session will feature a point-counterpoint format whereby two panelists will speak on different sides of each issue. Following their presentation, the topic will be open for questions and reactions from the audience. The issues that were selected by SCST members as important are:

1. Science majors and non-majors ought to take the same introductory courses.
   There must be separate introductory courses for the science majors and the non-majors.
2. We cannot do it all, so we must emphasize content over concepts.
   We cannot do it all, so we must emphasize concepts over content.
3. Teachers can motivate students to learn science.
   Motivation comes from within; teachers cannot motivate students to learn science.

INQUIRY-BASED LABORATORIES AT THE COLLEGE LEVEL HOW TO BUILD THEM, HOW TO USE THEM

Douglas Schamel
Department of Biology and Wildlife
University of Alaska Fairbanks
Fairbanks, AK 99775

Inquiry-based laboratory exercises are now becoming more popular at the college level. There are specific ways in which such laboratories can be built out of the more standard, "cookbook" laboratory sessions. We will share our favorite inquiry-based laboratory exercises and briefly explain how they were "invented". Copies of these exercises will be available, including troubleshooting and preparation tips.

William H. Leonard: "Uncookbooking your laboratory investigations"
Richard Mortensen: "Cooperative learning in paired laboratories: Tools to trade with"
Helen G. Koritz: "Using the Allium test in an inquiry laboratory"
Douglas Schamel: "Investigating leaf color change in fall"
Henry Knizeski: "Understanding algal growth and productivity using computer simulation"

INTEGRATING UPDATED INSTRUMENTATION INTO THE SCIENCE CURRICULUM

Eleanor D. Siebert
Department of Physical Sciences
Mount St. Mary's College
12001 Chalon Road
Los Angeles, CA 90049

The College Science Instrumentation Program has provided funds to Mount St. Mary's College to assist in updating instrumentation in the natural sciences laboratories. Funds were used to purchase four instruments: a UV-VIS recording spectrophotometer, a gas chromatograph, a high performance liquid chromatograph (both with computing integrator), and an atomic absorption spectrophotometer. Applications of these instruments have been introduced across the chemistry curriculum and thereby impact all majors in the sciences, as well as students in preprofessional health programs. The greatest impact of the NSF-CSIP has been on upper division courses, especially Instrumental Analysis where a new course format has been developed. Freshmen in the Honors Laboratory have used selected instruments where experiments have been developed to illustrate a modern analytical technique while producing results relevant to their studies. This presentation will focus on the impact of the NSF-CSIP across the chemistry curriculum at Mount St. Mary's College, a college with a strong liberal arts tradition. Special attention will be given to curriculum, developments in Instrumental Analysis and Freshman Honors Chemistry.

PROBLEM-SOLVING AND COMPUTER-SIMULATED EXPERIMENTS IN COLLEGE SCIENCE TEACHING

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500 College Drive
Lake Jackson, TX 77566

Many of the commercially available computer-simulated experiments were designed by college professors to appeal to their intended customers — other professors within their scientific discipline. These efficient and intellectually attractive simulations, however, may not produce learning in the ultimate users, i.e. students enrolled in science courses. If students are novices with regard to the knowledge being presented, their professor must first tell them how to use the simulated experiment — this defeats the purpose of student-centered learning. The presenter used his students and ex-students to design and classroom-test four simulated experiments for use in introductory general chemistry courses. The entire sequence of scientific investigation is presented on-screen to enhance the student problem-solving process: 1) In the pre-lab phase, students select the prerequisite information they need from a menu-driven program. They then take a pass-fail pre-lab quiz. 2) In the simulated experiment, students make decisions regarding the experimental parameters, perform the experiment, and receive a minimum of feedback. 3) In the post-lab phase, they organize their data into a graph or summary table and describe the apparent generalization(s), verbal or mathematical. The presenter will offer suggestions on how participants can apply the ACID TEST/CRASH TEST to commercially available computer-simulated experiments to reflect their students' novice-type approach to problem-solving. The interactions of problem solving with cognitive development and sex differences are discussed.

ABSTRACTS FROM REGIONAL MEETINGS, 1990

LONG BEACH, CALIFORNIA

SCIENCE CURRICULA FOR MAJORS
A PANEL DISCUSSION

Representatives from the National Association of Biology Teachers (NABT), the American Association of Physics Teachers (AAPT), and the American Chemical Society (ACS) focused on the decline in numbers of majors within their respective disciplines and current curriculum developments within programs especially at the introductory level. Ken Ozawa, Executive Secretary of AAPT, spoke of efforts to introduce twentieth-century physics into the introductory courses. Agreement on topics to be included has been reached and a report will be issued. Herb Kaesz, member of the Committee on Professional Training of the ACS, spoke of efforts to make chemistry more relevant to students in introductory courses. This approach has been successful at the high school level and will be extended to the college level. Zac Hanscom, NABT, spoke of current efforts to identify the outcomes of an undergraduate biology major. Joan Valentine described changes in the third quarter introductory chemistry course for honors students at UCLA. The goal is to bring the challenge of research and the excitement of discovery to students who are most likely to choose chemistry or science as a major.

SAN JUAN, PUERTO RICO

MEETING THE SCIENCE EDUCATION NEEDS OF THE HISPANIC STUDENT

Sr. John Karen Frei
Department of Biological and Biomedical Sciences
Barry University
Miami, FL 33161

Barry University, Miami, Florida, has a large minority population of students which reflects the population of the Miami area at large. The entering Fall 1989 class of freshmen and transfer students was composed of 47% minority students of which 36% were Hispanic. The percentage of minorities studying as biology majors is 68%; the majority of which are Hispanic. Over the years, the percentage of minority students majoring in science has been increasing. We have employed many strategies to increase the number of minorities majoring in science, and likewise to retain these students. The strategies to be discussed include intensive advising, contact when possible with the family, the institution of two-three semester hour freshman level developmental science courses and the restructuring of a junior level Seminar course. These courses are designed to help not only our Hispanic students; but other minority students as well. We find the entering students to be talented but underdeveloped.

ENCOURAGING HISPANIC STUDENTS TO PURSUE GRADUATE WORK IN THE SCIENCES: PROGRAMS AT HUNTER COLLEGE

David Lavallee
Chemistry Department
Hunter College
The City University of New York
695 Park Avenue
New York, NY 10021

Approximately one quarter of Hunter College's student body of 20,000 identify themselves as Hispanic. More trace their roots to Puerto Rico than to other countries, but there are significant numbers from other Caribbean islands and several Central and South American countries. We have seen an increasing number of Hispanic students choosing the sciences as a major. We have directed efforts to make science more visible on campus, to expose students to their peers who are engaged in research and to attract students who have enrolled in allied health professions into the fields of biology and biochemistry. Three programs at Hunter College have succeeded in encouraging Hispanic students to pursue PhD degrees in the sciences: an MBRS program in biology, chemistry, physics and psychology, a MARC program in biology, chemistry and physics and a MARC program in anthropology, psychology and sociology. Several students from these programs have won prestigious fellowships (Ford Foundation, Howard Hughes, MARC predoctoral and NSF). Activities of the programs and student case studies will be presented.

WASHINGTON, DC

EFFECTIVE MOTIVATIONAL TECHNIQUES FOR SCIENCE LITERACY COURSES

Mario W. Caprio
Suffolk Community College
Selden, NY 11790

Non-science majors often arrive at their introductory science courses less than willing to embrace the wondrous challenge before them. Indeed, instructors often cite lack of motivation as the major impediment to learning and teaching science literacy courses. This session will focus on several motivational techniques which can make a difference to students as well as teachers. If time allows, the audience will be able to react to the presentation and share some strategies.

ENHANCING THE SCIENCE KNOWLEDGE OF ELEMENTARY SCHOOL TEACHERS ONE SMALL LIBERAL ARTS COLLEGE'S APPROACH

Virginia A. Colten-Bradley and Allan K. Hovland
Natural Science and Mathematics Division
St. Mary's College of Maryland
St. Mary's City, MD 20686

This talk will describe a successful inservice program for elementary school teachers that has led to significant interactions between local elementary school teachers and college faculty. Sensing that the local school systems were not immune to the national dilemma in the science preparation of elementary school teachers, the authors contacted the science supervisors of the several neighboring counties to design an appropriate science inservice program for the teachers in the region. Through these discussions the SCIENCES program was developed. SCIENCES is comprised of three components -- a science workshop, an innovative writing assignment, and follow-ups during the academic year. The program is designed to encourage the teachers to integrate science into the teaching of math and language arts. The summer workshop features developing teachers' knowledge in several content areas through the use of hands-on activities. A benefit of the program has been the establishment of a connection between the elementary school teachers and the college faculty. The elementary school teachers have begun to tap the college faculty as a source for expertise on given science subjects, for updates on recent developments, and as guest presenters in their classrooms. The program is entering its third year and has been highly praised by the teachers and the supporting school systems.

A PILGRIMAGE TO DAYTON:
ENRICHING SCIENCE LITERACY COURSES WITH HISTORICAL PERSPECTIVES

Nathan Dubowsky and Elliott M. Hartman, Jr.
Departments of Biology and Physical Sciences
Westchester Community College
Valhalla, NY 10595

It is now generally agreed that social and historical perspectives should be tightly woven into the fabric of science literacy courses. This approach has been shown to stimulate student interest and to make them more fully aware of the broader implications of the topics studied. The presenters will describe how they used insights and photographs collected during a "field trip" to Dayton, Tennessee (home of the Scopes "Monkey Trial") to enrich a discussion of evolutionary theory. They will also describe successful techniques and locations for additional "history of science" collecting trips.

ELEMENTARY TEACHER PARTNERSHIPS OVERCOME SCIENCE-PHOBIA

Elizabeth A. Godrick
Department of Biology
Boston University
5 Cummington St.
Boston, MA 02215

Twenty-five pairs of teachers, grades 1-5 are participating in a two and one-half year training program with a mathematician and scientists in astronomy, biology, geology and physics. This project, named Science With A Partner (SWAP), is a collaboration among NSF, Boston University, and twenty-five Boston elementary schools. The partners, representing a broad ethnic diversity from the system (31 Afro-American, 13 white, 5 Hispanic and 1 Asian) attend two summers of three weeks and two winters of four Saturday science workshops. Physics and astronomy are presented the first year and geology and biology the second. Major objectives of the program are to INCREASE 1)accurate elementary science teaching and meaningful hands-on science by each participant, and 2)science teaching in the school at large. Problem-solving in mathematics is incorporated into all work. Critical to the success of the program is 1)trust from the school system's top administration as well as from the partnered teachers, of scientists, 2)support by the principal in action as well as word, 3)partnering of the teachers to build their self confidence and creativity, and 4)commitment and enthusiasm of the scientists. The latter is accomplished through lecture, hands-on laboratory work, a telephone hotline for questions, visits to elementary school classrooms and teacher inservice days, and hosting field trips to their own labs.

BIOMEDICAL TERMINOLOGY FOR FRESHMAN BIOLOGY STUDENTS

Elizabeth T. Hays
Biological and Biomedical Sciences
Barry University
Miami Shores, FL 33161

For a variety of reasons, many of the students entering college and wishing to pursue preprofessional programs in the sciences are quite deficient in their knowledge of the language of science. As part of the Freshman experience for biology majors and biology prepreps at Barry University, a biomedical terminology course has been introduced into the curriculum. The author will present her experiences in teaching this course and examine the impact this course or exposure to biomedical terminology may have on beginning biology and biomedical students.

BRINGING SCIENCE AND ART TOGETHER FOR ELEMENTARY SCHOOL CHILDREN

Allan K. Hovland, Michel Demanche, Joseph Davis and Cynthia Wright
Departments of Natural Science, Math, and Arts and Letters
St. Mary's College of Maryland
St. Mary's City, MD 20686

In the typical elementary school curriculum, science and art are presented as completely unrelated subjects. This talk will describe a two-week summer workshop conducted by the faculty of St. Mary's College in which the students (grades 2-6) participated in a series of activities that make clear and significant connections between art and science. Each day featured three hours of hands-on science activities (primarily chemistry) and hands-on art work. Examples of the science-art connections made included: linking balance building in science with mobile construction in art; exploring light and shadows in science while doing photography in art; testing color combinations and separations by mixing paints in art, while doing chromatography in science.

A PARENT-VOLUNTEER-LED HANDS-ON SCIENCE CURRICULUM FOR FIRST GRADERS

Maryann McDermott Jones
Department of Chemistry
Howard University
Washington, DC 20059

During the 1989-90 academic year we introduced a parent-volunteer-led, weekly science curriculum to all first graders in a racially mixed (60% minority) public school in Alexandria, VA. The experiments and demonstrations -- chosen to illustrate grade-level Standards of Learning mandated by the Virginia Department of Education, were thematically organized into two subject areas: Living Things Require Water (Nutrition), Air and Light to Survive, and What Conditions Make the Weather. Following introduction of the "theme" by the classroom teacher in sessions divorced from the experimental meetings, each week's exercises were designed to reinforce the theme through a single "punchline" point which was then demonstrated, usually by more than one example. Each week's punchline was reiterated the following week as a prelude to new experiments which further broadened the theme, ultimately resulting in the integration of the two subject areas. While the selection and organization of the exercises was made by a university instructor biochemist, all other parent volunteers were non-scientists, most of whom had no teaching experience. In the 1990-91 academic year, the first grade program will be directed totally by non-scientists, using the curriculum established this year. We will present the curriculum and the logic behind its organization, as well as commentary by classroom teachers and students as to its effectiveness.

REAL CHEMISTRY FOR SECOND AND THIRD GRADERS (?)

Maryann McDermott Jones
Department of Chemistry
Howard University
Washington, DC 20059

We have introduced "real" chemistry — using real chemical reactions described with real chemical terminology — to second and third graders in a racially mixed (60% minority) public school in Alexandria, VA. The five week long, after-school program was given in three sessions of 12 children each, in a hands-on manner, overseen by a university instructor biochemist, but directed by non-scientist parent volunteers during the 1989-90 school year. While the subjects examined -- Chemical vs. Physical Changes; Electrolytes and Non-electrolytes; Gases Which Support or Counter Combustion; Chemical Receptors Associated with Taste and Smell; and Properties of Acids and Bases -- are frequently studied at much higher grade levels, the experiments were designed principally to hone observation skills -- "What did you observe: see, feel, smell?" -- or to emphasize phenomena with which they were already familiar but had not recognized as chemical phenomena -- what causes the formation of bubbles; when something dissolves does it disappear or simply change its form; gases occupy space; taste and smell often work together. We will review the curriculum describing which points of emphasis were made for purposes of age appropriateness and will report commentary by classroom teachers and students as to the effectiveness of the program.

VISUALIZING DYNAMIC MOLECULAR GEOMETRY: MACINTOSH ANIMATIONS FOR AN INTEGRATED CURRICULUM

Vincent C. LoPresti and Alfred R. Garafalo
Departments of Pharmacology and Biological Sciences
Massachusetts College of Pharmacy and Allied Health Sciences
Boston, MA 02115

Polypeptide folding, ligand-protein interactions, ion channel function and transmembrane signal transduction are processes which underly most cellular energy transformations and cellular and organismal information flow. Visualizing these dynamic molecular processes is an important step for students in acquiring an appreciation of biological organization and communication. Examples of molecular animations designed to assist students in the visualization process and which are part of a HyperCard development project for an integrated chemistry-biology freshman curriculum will be presented. The relationship of the animations to approaches pursued in the integrated curriculum will also be discussed. For example, topic coordination between the two courses provides the flexibility to pursue a "top-down" approach, using general aspects of molecular structure to illuminate process in biology. This is complemented by discussions about bonding in chemistry that incorporate biological examples. The relative ease of use, inexpensiveness and HyperCard compatibility of the software (Studio 1, Electronic Arts) can allow instructors to tailor animations to the needs of a given curricular approach and/or student population.

A LOOK AT GENERAL LIFE SCIENCE ILLITERACY IN COLLEGE UNDERGRADUATES

Thomas R. Lord
Biology Department
Indiana University of Pennsylvania
Indiana, PA 15705

Several recent studies have suggested that students of today score lower on exams of general knowledge than did their counterparts a decade ago. Not only have the means of various national achievement tests, such as the SAT and ACT, revealed this down-swing but several contemporary surveys of student knowledge conducted on high school and college campuses by various educationally-minded groups also suggest this alarming trend. A survey of the National Geographic Society, for example, revealed that a surprisingly high number of high school students could not locate the United States on a world globe. How do students of today fare on tests of general life science knowledge? To find out a survey was conducted on college freshmen at a mid-size eastern university. The survey consisted of twenty-five questions of basic life science knowledge drawn from textbooks designed for middle school students. Over 300 students took part in the survey. This presentation discusses the rather surprising results of this survey.

SCIENCE LEARNING STRATEGIES WORKSHOPS: AN ANCILLARY TO THE SCIENCE COURSE

Stephanie Mazur
Department of Science
Borough of Manhattan Community College
New York, NY 10007

Many students experience difficulty in their courses even though they have completed remedial work. We believe that their limitations are largely due to poor study skills; skills which many educators believe students acquire before entering college. Although students have learned to read at grade level and to do expository writing, they become completely lost when they are faced with the challenge of science courses where they are asked to learn and apply vast amounts of conceptual information using new vocabulary. They don't know how to tackle their studies, organize their assignments or take tests. We would like to share with our colleagues our experience in developing and implementing a unique series of Science Learning Strategies Workshops to promote more effective and more efficient science learning. We begin with Learning Aptitude Assessments to determine specific areas of student strength and weakness. A key factor in enriching our workshops has been our development of interactive exercises utilizing a single text chapter and its related classroom content material for each strategy presented. This differs from study skills manuals which address similar strategies, but utilize examples from broad content areas, most of which are outside of science. Because our students enter science courses with underdeveloped learning skills we must equip them with strategies that transform them into successful learners.

THE COLORATION OF FOODS IN THE 19TH CENTURY

Harold T. McKone
Department of Chemistry
Saint Joseph College
West Hartford, CT 06117

Prior to the introduction of coal tar aniline dyes for the coloring of foods and beverages in the late 1800's, mineral salts were routinely added to tea, candy, wine, pickles, flour, butter, cheese, and chocolate to improve color and appearance and to mask decay. Concern over the safety of these inorganic salts was expressed as early as 1396 when an Edict in Paris forbade the coloring of butter. Nevertheless, as late as 1840, Chinese tea seized in London was found to contain copper carbonate, copper arsenite, and potassium chromate. In addition, of the 100 samples of candy analyzed for mineral salts in England in 1875, 59 contained lead chromate, 12 were colored with red lead, 6 with mercury sulfide, and 4 with white lead. An examination of this information sets the stage for a more rational appraisal of the relative toxicity of our presently approved aniline dyes such as Red #40 and Yellow #5 and the recently "disapproved" Red #3.

WRITING IN THE COLLEGE SCIENCE CLASS: WRITING TO LEARN; GOING PUBLIC; CHANGING FOCUS

Martha Ritter
Biology Department
Venango Campus, Clarion University
Oil City, PA 16301

Lois Green, Director of Clarion's Writing Across the Curriculum Program, will make a short presentation about writing as a way of learning and the implications for mastery learning through increased opportunities for students to actively use language skills — writing and speaking as well as reading and listening. Martha Ritter will present ways of incorporating writing into a biology curriculum, including her successful attempts to involve her students in the broader community through letters to the editor, community projects and other writing of a public nature. Bill Barnes will present experiences with concerted writing efforts and how they have altered his classroom focus on material and procedure. Bill will be discussing his use of writing center tutors and how his one long annual term paper in genetics has come to be five shorter papers focusing on specific genetic concepts. These short presentations will be followed by dividing the group into thirds, each group with one presenter eliciting talk and writing from the audience regarding the information presented.

ELEMENTARY STUDENT VIDEOMICROSCOPY -- A COLLEGIATE ENDOWMENT

Martha Ritter, V. Harry and B. Belzer
Biology Department
Clarion University — Venango Campus
1801 West First Street
Oil City, PA 16301

This presentation will highlight the benefits from a pioneering effort of the Pennsylvania Science Teachers Education Program (PA STEP), designed to put the excitement of videomicroscopy into the hands and hearts of elementary school students. The technology of videomicroscopy allows the students to make their own narrated videotapes of miniature organisms seen through the eye of a microscope. This PA STEP program uses the college laboratory to develop the biological and technical skills needed by teachers to bring videomicroscopy to their classrooms, then lends them the video and microscope equipment that will allow even their third graders to produce their own narrated videocassettes of the microscopic world. The experience opens a wide door for young students into the world of hands-on science and technology. The students receive the lasting benefit of tangible video/audio evidence of their classroom adventure that can be shared with friends and relatives. The excitement and enthusiasm that is generated promises to make the world of science and technology a more accessible avocational/career consideration for youngsters. Moreover, preparation for the activity involves the students in a multitude of cross-disciplinary pursuits, including library research, writing, spelling, math, drawing, public speaking, biology and microscopy. This presentation will consist primarily of video excerpts of students at work and their completed videosegments.

COLLABORATION BETWEEN BIOLOGY AND REMEDIAL READING CLASSES STRATEGIES TO ASSIST ACADEMICALLY UNDERPREPARED STUDENTS

Sylvia Saunders and Cynthia Richards
Science Dept. and Developmental Skills Dept.
Borough of Manhattan Community College, CUNY
199 Chambers Street, N653 Science Dept.
New York, NY 10007

If the United States is to maintain its global competitiveness in the twenty-first century, we must educate citizens to be literate, not only in the "Three R's", but in the sciences as well. We, as educators, must strive to develop strategies to produce college graduates who will be qualified to fill the overwhelming number of jobs in science and technology which government and corporations are expected to generate in the 1990's and beyond. At our college we are concerned that a significant percentage of our students are academically underprepared and experience great difficulty in completing the eight credits of science which non-majors need to graduate. We are trying to utilize intensive collaborations between professors from Science and Developmental Skills Departments to alleviate some of the difficulties which most of these students encounter in introductory biology courses. These difficulties are most evident in reading assignments in the biology textbook; in writing assignments such as term papers and laboratory reports; in comprehension of new science concepts and in dealing with science vocabulary. Strategies which we have used in this team-teaching or course-pairing approach will be presented and evaluative responses from students will be discussed.

COMMUNITY COLLEGE MEANS COMMUNITY SCIENCE INVOLVEMENT

Vera Zdravkovich, Patricia Basili, Patricia Cunniff and Barbara Gage
Science and Technology Resource Center
Prince George's Community College
Largo, MD 20772-2199

The educational preparation of local students significantly impacts on what we do at the college level. To prepare our potential students and foster increased interest in science, a Science and Technology Resource Center (STRC) is developed. Under its auspices programs address the needs of students and teachers from elementary to high school, with emphasis on the needs of minorities in our locale. The STRC has conducted many programs including an all-day "science experience" for 4-6 graders attended by 1000 students and their parents called "Science Trek", Summer Science Institutes for county elementary teachers to enhance teachers' science content knowledge, develop awareness of common misconceptions and provide strategies to improve science teaching, a summer high school student forensic chemistry workshop with a teacher component during the school year, and cooperative effort with the state university in which our faculty teach science content courses for elementary teachers. These programs have strengthened ties with our community and school system.

"I have been assigned to teach a 'non-major'
science course for the first time this semester
and need all the help I can get..."

An Open Letter of Invitation

Dear Colleague:

While most college science faculty were teaching "traditional" science courses to "traditional" science students using "traditional" and comfortably familiar teaching techniques, others of us, by choice or by necessity, followed different paths. We developed and taught what were viewed in the past as the often unconventional "non-science major" courses for the general education students.
These experiences, however, provided unique opportunities to explore new areas, to develop new courses, to explore new strategies of teaching. Development of a scientifically literate and supportive citizenry who would understand the nature of science and the role science plays in an ever more technologically dependent society became a major concern.

Now, with significant increases in demand for "science literacy courses", many "traditionalists" have found themselves unceremoniously tossed into the unfamiliar academic arena of teaching non-science students whose sole motivation may be to fulfill a college graduation requirement.

Where to begin? What to teach and how? How to motivate these students? What achievements can be expected of these students? What are the reasonable and measureable goals of such courses?

It is for those colleagues who now face the very real challenges of teaching science literacy courses for the first time, we have have assembled this National Directory of Science Literacy Consultants. They look foward to sharing their experiences and expertise.

This National Directory of Science Literacy Consultants is a direct outcome of the SCST Committee for Introductory Courses' deliberations on the problems commonly confronted by those assigned to teach science literacy courses. It should be emphasized however, that while the individuals listed in the directory have agreed to share their expertise, any specific arrangements or agreements are private matters between you and the consultant. Further, listing in the directory does not imply endorsement or validation of consultant's credentials by the Society of College Science Teachers or by the Committee for Introductory Science Courses of SCST.

For the Committee on Introductory Science Courses:

Elliott M. Hartman Nathan Dubowsky
Westchester Community College
75 Grasslands Road
Valhalla, New York 10595

CONSULTANT	SCIENCE LITERACY COURSES TAUGHT	AREAS OF INTEREST
William E. Adams Dept. of Chemistry and Physics Salem State College Salem, MA 01970 (508) 741-6236	Forensic Science, Environmental Chemistry	*
Joanna Ambron (Dr.) Biology Department Queensborough Community College 36th and Springfield Blvd Bayside, New York (718) 631-6336	Principles of Biology, General Biology	underprepared and minority students "writing to learn strategies to actively involve students"
Alan D. Cooper (Dr.) Dept. of Natural and Earth Sci. Worcester State College 486 Chandler Street Worcester, MA 01602 (617) 793-8000 Ext.8600	Contemporary Chemistry, Introduction to General, Organic and Biochemistry, Energy in the Modern World	*
Daniel E. Dick Dept.of Natural and Earth Sci. Worcester State College 486 Chandler Street Worcester,MA 01602 (508) 793-8000 Ext 8583	Physical Science, Science and Society, Fundamentals of Library Research	Physics,solar Energy and "appropriate technology"
Marvin Druger Dept. of Biology and Dept. of Science Teaching Syracuse University 214 Lyman Hall Syracuse, New York 13244-1270 (315) 443-3820	General Biology (Sci-Lit)	*
Nathan Dubowsky (Dr.) Dept. of Biology Westchester Community College 75 Grasslands Road Valhalla, New York 10595 (914) 285-6916	Biological Science Evolution and the Origin of Life Introduction to Oceanography	Development of "wet"laboratory exercises for origin and evolution of life, History of Biology Evolution/creation issues

Fred L. Fifer Jr. (Dr.) Science Education University of Texas at Dallas P.O. Box 830688 Mail Sta. FN 32 Richardson, Texas 75083-0688 (214) 690-2496	History and Philosophy of Natural Science	*
Elliott M. Hartman,Jr. Dept.of Physical Sciences Westchester Community College 75 Grasslands Road Valhalla, New York 10595 (914) 285-6905	Astronomy Earth Sciences Historical Geology Intro.Oceanography Origin and Evolution of Life	Development of "wet"labs for teaching of origin and evolution of life Teaching methods for teaching physical sci to science literacy classes
Elizabeth Hays (Dr.) Academic Health Science Center Division of Biological and Biomedical Sciences Barry University 11300 Northeast Second Avenue Miami Shores, Florida 33161 (305) 758-3392	Non-major courses	Motivating non-science majors
Peter Heywood (Dr.) Section of Molecular,Cell and Developmental Biology Brown University Providence, RI 02912 (401) 863-3415	Biology for non-majors Biology for Majors	Cell biology, Botany,Protistology, Science education, Hypermedia
Art Hobson Dept. of Physics University of Arkansas Fayetteville, AR 72701 (501) 575-5918	Physics and Human Affairs	*
William S. Kermis (Dr.) Upham Hall (West Campus) University of Lowell Lowell,MA 01854 (508) 452-5000 Ext 2450/2771	Science,Technology and Society	"Science, technology, and reading:A need for language specificity"
Lavinia Kumar Biology Dept. Seton Hall University South Orange, New Jersey 07079 (201) 761-9044	Introduction to Biology	development of new courses for non-majors, laboratories, videodiscs, computer technology

Theodore Lopushinsky (Dr.) Department of Natural Sciences Room 100 North Kedzie Lab Michigan State University East Lansing, MI 48824 (517) 355-6664	Ecology, Cosmology, Evolution, Human Reproduction, Bioethical Concerns	Science as a way of knowing using disciplines as the vehicle
Melvin Merken (Dr.) Worcester State College 486 Chandler St Worcester,MA 01602 (508) 793-8000 Ext.8600	Physical Science Nature of Chemical Change	Chemistry, Physics, Astronomy, and Earth Science
William J. Mullin (Dr.) Dept. of Biology Bag Service # 45111 University of New Brunswick Fredericton, N.B. Canada E3B 6E1 (506) 453-4584	Introductory Biology ("non-majors")	audio-teleconferences,
Eileen Murphy (Dr.) Environmental Science Dept. Douglass Project 18 Delar Pkway Apt B3 Rutgers University, Douglass College Frankin Park, N.J. 08823 (201) 932-9197	*	Environmental sciences "problems", Elementary science (general) for elementary school teachers,specific problems (environmental) in N.J. applied to general science concepts
Richard L. Myers (Dr.) Alaska Pacific University 4101 University Drive Anchorage, Alaska 99508-4672 (907) 564-8207	Natural Environment	*
Thomas W. Sharpless Dept. of Chemistry University of Hartford West Hartford, CT 06117 (203) 243-4407	Reasoning in Science (laboratory materials have been developed)	History and philosophy of the physical sciences
Brian R. Shmaefsky (Dr.) Dept. of Biology Northwestern Oklahoma State U. Alva, Oklahoma 73717 (405) 327-1700 Ext 230	General Biology for Nonmajors	Biology for nonmajors, science education of elementary ed. majors

Victor Showalter (Dr.) Center for Unified Science College of Arts and Sciences Capital University Columbus, Ohio 43209 (614) 236-6011	Scientific/Technologic Endeavor, Physical and Environmental Geology	Defining Scientific/Technologic literacy, testing for scientific/technologic literacy, design and development of interdisciplinary courses
Leona C. Truchan (Dr.) Biology Department Alverno College 3401 S. 39th Street Milwaukee, WI 53215 (414) 382-6000	Integrated Science I and II	Integrating Process/Concept-Ability-based teaching/assessing
Dee U. Silverthorn (Dr.) Depart. of Zoology University of Texas Austin, Texas 78712-1064 ((713) 471-7131	The Human Body	Physiology, textbooks for "in-house use"
S.Tourtellotte Dept. of Physical Sciences Albertus Magnus College 700 Propect Street New Haven, CT 06511 (203) 773-8550 Ext.283	Survey of Earth Sciences, Astronomy	Chemistry, physical sciences
Natalie K. Vallee (Dr.) Dept. of Sciences Lesley College 29 Everett Street Cambridge, MA 02238 (617) 868-9600 Ext 187	Biology, Physiology, Nutrition Biology, Health Education, Human Sexuality, Plant Science	Biology/Physiology and nutrition
Kenneth Wittig Dept. of Biology Siena College Loudonville, New York 12211	Nutrition	Nutrition, human physiology
Charles M. Wynn, Sr. (Dr.) Dept. of Physical Sciences Eastern Connecticut State U. 83 Windham Street Willimantic, CT 06226-2295 (203) 456-5258	Natural Science for Nonscience Majors, Foundations of Natural and Life Sciences	*

Douglas Zook (Dr.) Dept. of Science Ed. School of Education Boston University 605 Commonwealth Avenue Boston, MA 02215 (617) 353-2030	General Biology, Botany, Biomaterials for the Classroom, Microbial Life	Microbial life, Symbiosis, science teaching methods, curriculum development, environmental sciences

Note:
*- none specified

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If you wish to be listed in the next edition of the National Directory of Science Literacy Consultants, or if you have comments or suggestions about this edition of the Directory, please complete this slip and return to:

Dubowsky/Hartman
c/o Westchester Community College
75 Grasslands Road
Valhalla, New York 10595

Name..... College Address.....

Courses taught: .....

.....Zip.....

Areas of Expertise: Phone (....).....Ext... .

Comments:

Society for College Science Teachers
Southern Utah University
Cedar City, Utah 84720

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